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APPLICATION NO.	FILING DATE	FIRST-NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,636	11/24/2003	Yale Zhang	H310719US	9139
28079	7590	09/28/2005	EXAMINER	
GOWLING, LAFLEUR HENDERSON LLP ONE MAIN STREET WEST HAMILTON, ON L8P 4Z5 CANADA			LAU, TUNG S	
		ART UNIT	PAPER NUMBER	
		2863		

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/718,636	ZHANG ET AL.
	Examiner Tung S. Lau	Art Unit 2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 09 September 2005.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-16, 18 and 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-9-16, 18 and 19 is/are rejected.
- 7) Claim(s) 2-8 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_

## DETAILED ACTION

### Foreign Priority Papers

1. Foreign Priority Papers Filed on 09/09/2005 is noted by the examiner.

#### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 9-16 and 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Vaculik (WO 00/05013).

Regarding claim 1:

Vaculik discloses a method for monitoring the operation of a continuous caster in a start-up casting mode in which molten metal is shaped in a continuous caster to form a solidifying strand product before the continuous caster reaches a predetermined minimum caster speed (page 1-2, lines 25-8), the method including the following steps: retrieving historical data consisting of multiple historical observations of process variables for a plurality of continuous caster start-up operations (page 23, 3-8), the number of historical observations varying from one continuous caster start-up operation to another (page 8, lines 14-28); selecting a modeling set from said historical data to represent normal start-up operations of a continuous caster (page 10-12, lines 25-16); creating a synchronized data set of process trajectories from said modeling set in which the

number of historical observations from each continuous caster start-up operation is scaled to correspond to a selected length of strand product (page 9-11, lines 30-26); performing a multi-way principal component analysis (MPCA) on said synchronized data set to calculate the value of principal components  $T$  and a loading matrix  $P$  for each continuous caster start-up operation to develop a multivariate statistical model of normal continuous caster start-up operations (page 15-17, lines 6- 20); computing test statistics selected from the group consisting of Squared Prediction Error (SPE) and Hotelling  $T'$  (HT) for each observation from said multivariate statistical model (page 18-19, lines 6-24, fig. 3)

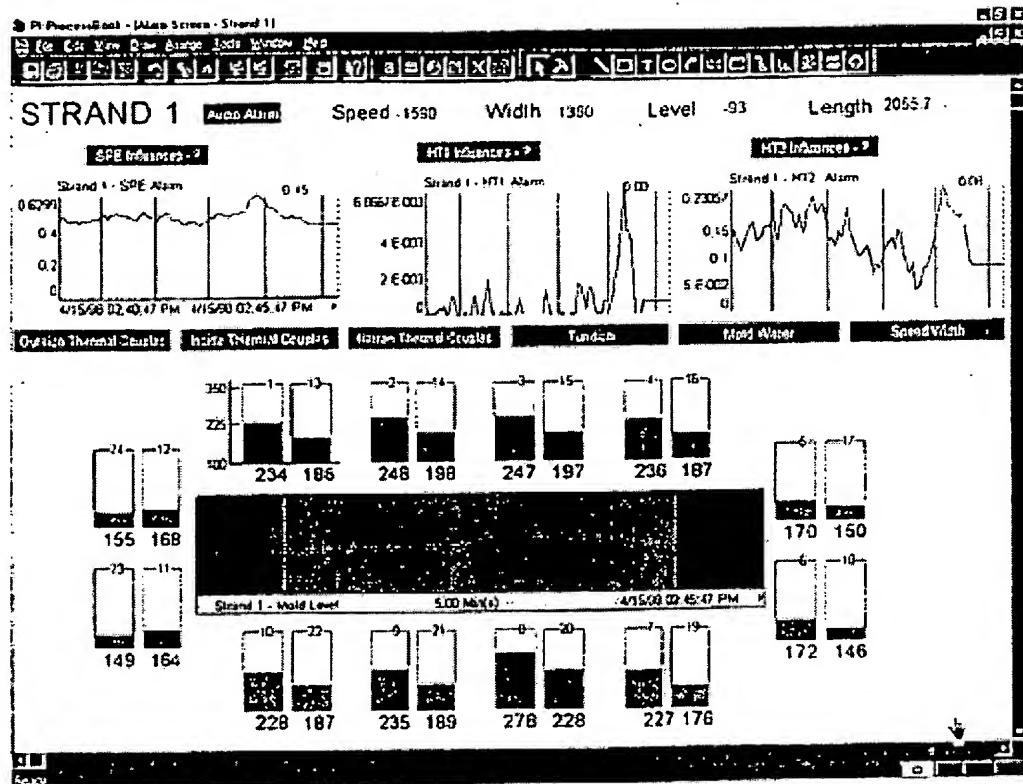


Fig 3

selecting control limits for said SPE and HT test statistics and their contributions; acquiring on-line data consisting of multiple observations of said process variables observed at an elapsed time  $t$  during a start-up operation of a continuous caster (page 18-19, lines 6-24); predicting future process trajectories for said on-line data for a start-up operation of the continuous caster producing said selected length of strand product (fig. 2, unit 31-39, page 23-24, lines 28-5);

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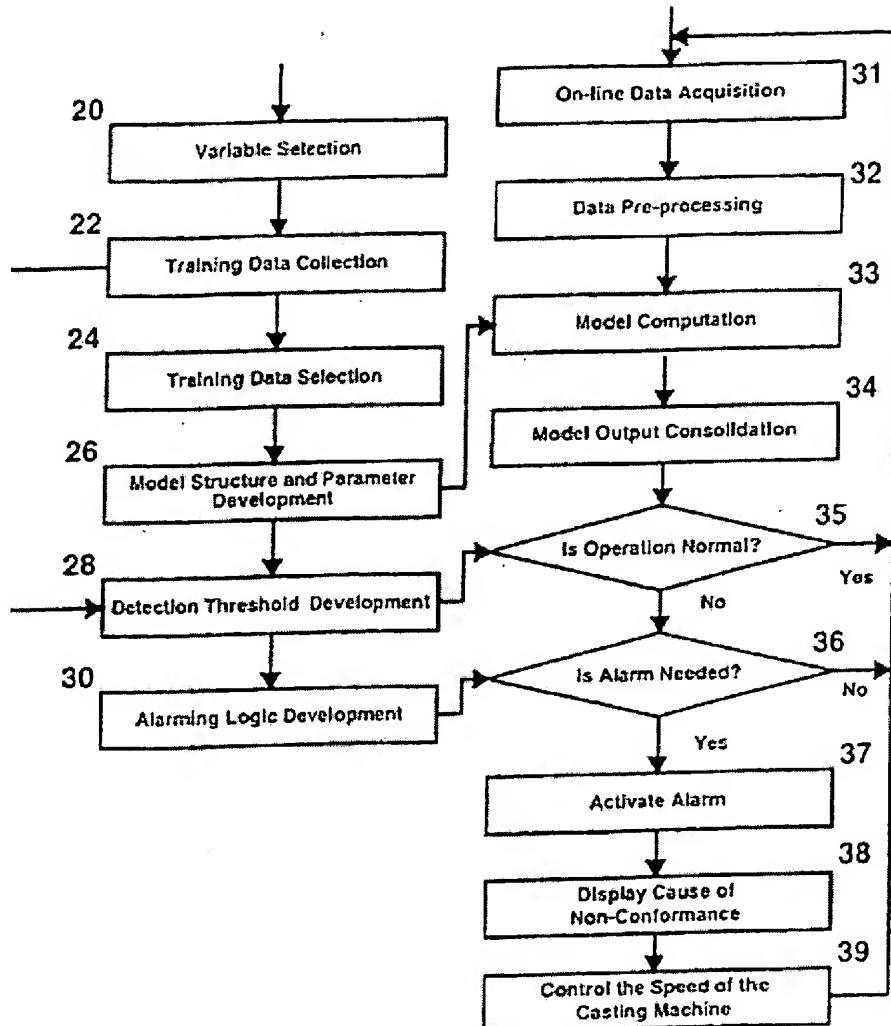


Fig 2

applying said multivariate statistical model 'to a matrix  $X_{new}$  of said future process trajectories to compute test statistics selected from the group consisting of Squared Prediction Error (SPE) and Hotelling T" (HT) (page 18-21, lines 6-8); comparing said test statistics computed from the matrix  $X_{new}$  to the said control limits ; and generating a detection signal, said detection signal being indicative of whether the continuous caster start-up operation is consistent with normal start-up operations in a continuous caster (page 23, lines 8-22).

Regarding claim 15:

Vaculik discloses a system for on-line monitoring the start-up operation of a continuous caster, which initiates the casting process from the state of pouring liquid an empty mould to reach a predetermined caster speed and achieve a stable operation (Col. 1, Lines 18-60), the system having (1) a data communication module for acquiring real-time process measurements during a caster start-up operation (Col. 3, Lines 5-61, fig. 7, unit 60); (2) a trajectory synchronization module for interpolating the acquired real-time process measurements based on non-uniform synchronization scales in the casting length to synchronize the process trajectories of the start-up operation (fig. 3, unit HT1 interface); (3) a model calculation module for conducting MPCA calculations based on the said obtained synchronized process trajectories and sending a detection signal for impending breakouts during the start-up operation (fig. 3); and (4) a human machine interface for displaying current start-up operation conditions (fig. 5).

Regarding claim 9, Vaculik discloses grade of metal and width (page 11, lines 2-14); Regarding claim 10, Vaculik discloses operation exceeds limit 3 consecutives sampling interval (page 12, lines 3-16); Regarding claim 11, Vaculik discloses behavior based on SPE and HT statistic (page 21-22, lines 14-21); Regarding claim 12, Vaculik discloses cause of abnormal behavior has the highest ratio (fig. 3); Regarding claim 13, Vaculik discloses SPE and HT are

updated (fig. 3); Regarding claim 16, Vaculik also discloses multi-way principle component analysis with range (Col. 5-6, Lines 1-40, fig. 3); Regarding claim 14, Vaculik discloses average trajectory for process is constant (Col. 8-9, Lines 64-10, fig. 3, unit 93). Regarding claim 18, Vaculik also discloses a system having a visual display screen to display the following information about the start-up operation: alarms of impending breakouts during the start-up operation or other abnormal start-up operations from the said detection signals: time duration of start-up operation and selected synchronized process trajectories within this duration associated with upper and lower control limits for each process trajectory (fig. 3, unit strand1); Regarding claim 19, Vaculik also discloses real-time process measurements selected from the group comprising: product notification, casting speed, and strand length whereby the said MPCA calculations are performed in a start-up state and normal PCA calculations are performed in a stable run-time state (Col. 3, Lines 5-67).

#### ***Allowable Subject Matter***

3. Claims 2-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitation of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: prior art fail to teach: regarding claim 2, start up speed is at least 0.1 m/s; regarding claim 4, comprising group from mold thermocouple readings, temperature differences between pre-defined thermocouple pairs, stopper rod position, tundish car net weight, mold cooling water flows, temperature difference between inlet and outlet mold cooling water, casting speed, and calculated heat flux transferred through each mold face; regarding claim 5, based on non uniform scales; regarding claim 7, control limit are selected exclude 5% of casting operation at start-up; regarding claim 8, variable to SPE or HT are selected exclude 5% of casting operation.

Claim 3 is objected due to their dependency on claim 2.

Claim 6 is objected due to their dependency on claim 5.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

4. Applicant's arguments with respect to the amended claims have been considered however, applicant's arguments filed 09/09/2005 have been fully considered but they are not persuasive.

A. Applicant argues that the prior art does not show the 'start up operation' and that the prior art is in 'continues operation'.

The examine reminds to the applicants that during patent examination, the pending claims must be "given the broadest reasonable interpretation consistent with the specification." Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969). While the meaning of claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims must be interpreted as broadly as their terms reasonably allowed. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Since the applicant has no special definition of 'start up', the Merriam Webster's dictionary, tenth edition define 'start- up' as to move suddenly and violently, Vaculik discloses to move suddenly and violently' in Col. 6, Lines 8-16, fig. 3, unit strand1, SPE, HT1, HT2 curve in the system.

### Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung S Lau whose telephone number is 571-272-2274. The examiner can normally be reached on M-F 9-5:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 571-272-2269. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TL

**BRYAN BUI**  
**PRIMARY EXAMINER**

